Examples of What to Report

- Contamination of a water supply well
- Contaminated seeps, sediment or surface water (spills to surface water must be reported immediately under Water Quality law)
- Vapors from contaminated soil or ground water entering a building, utility vault or other structure
- Free product on the ground surface or ground water

Examples of What to Report

- Abandoned containers (e.g. tanks or drums) with more than a trace of contaminants
- Soil classified as hazardous waste
- Unpermitted industrial waste or hazardous waste disposal
- Where hazardous substances have leaked or been dumped on the ground
- Leaking underground storage tanks

Administrative Approval Processes

- Consent decree
  - Standard settlement
  - Deminimus settlement
  - Prospective purchaser agreement
- Agreed order
- Enforcement order
- "No Further Action" letter under Ecology's Voluntary Cleanup Program

Public Participation in Cleanup Decisions --The Key to Community Acceptance--

- No backroom deals!
- Public participation plan
- Public notices/meetings/formal hearings
- Public participation grants
- Citizen technical advisor (currently vacant)

Cleanup Standards

Cleanup Standard =

Concentration (cleanup level)

+ Applicable Standards in State & Federal Law (ARARS)

+ Point of Compliance

Must use "reasonable maximum exposure"

Cleanup Levels--Calculation Methods

- **Method A (Simple Site Method):** Table values and standards from other applicable laws (ARARs) & procedures in the rule
- **Method B (Universal Method):** ARARs plus formulas & procedures in the rule
- **Method C (Conditional Method):** ARARs plus formulas & procedures in the rule (use limited to certain conditions)

Calculation Methods—Method A

Relevant Table 720-1 Ground Water Cleanup Levels for Gasoline Range Organics

Parameter	Cleanup Level (ug/l)
TPH	800 (with benzene)
	1,000 (with no detectable benzene)
Benzene	5
Toluene	1,000
Ethyl Benzene	700
Xylenes	1,000 (total of o, p & m xylene)
EDB	0.01
EDC	5
Lead	15
MTBE	20
Naphthalenes	160 (total of naphthalene plus 1 and 2 methyl naphthalene)

Calculation Methods—Method B

- Cleanup levels are typically based on young child exposure
- Allowable risk for carcinogens:
  - Individual chemicals: $1X10^{-6}$
  - Multiple chemicals & exposure pathways: 1 in 1 hundred thousand or $1X10^{-5}$
- Allowable risk for noncarcinogens:
  - Individual chemicals: hazard quotient of 1
  - Multiple chemicals & exposure pathways: hazard index of 1

Calculation Methods—Method C

- Cleanup levels are based on adult exposure
- Allowable risk for carcinogens:
  - Individual chemicals: $1X10^{-5}$
  - Multiple chemicals & exposure pathways: 1 in 1 hundred thousand or $1X10^{-5}$
- Allowable risk for noncarcinogens:
  - Individual chemicals: hazard quotient of 1
  - Multiple chemicals & exposure pathways: hazard index of 1

Reasonable Maximum Exposure (RMEs)

- Cleanup levels must be based on the reasonable maximum exposure (RME) expected to occur under both current and future site conditions

- The MTCA rule specifies default RMEs for ground water, surface water, soil and air

Reasonable Maximum Exposure (RMEs)

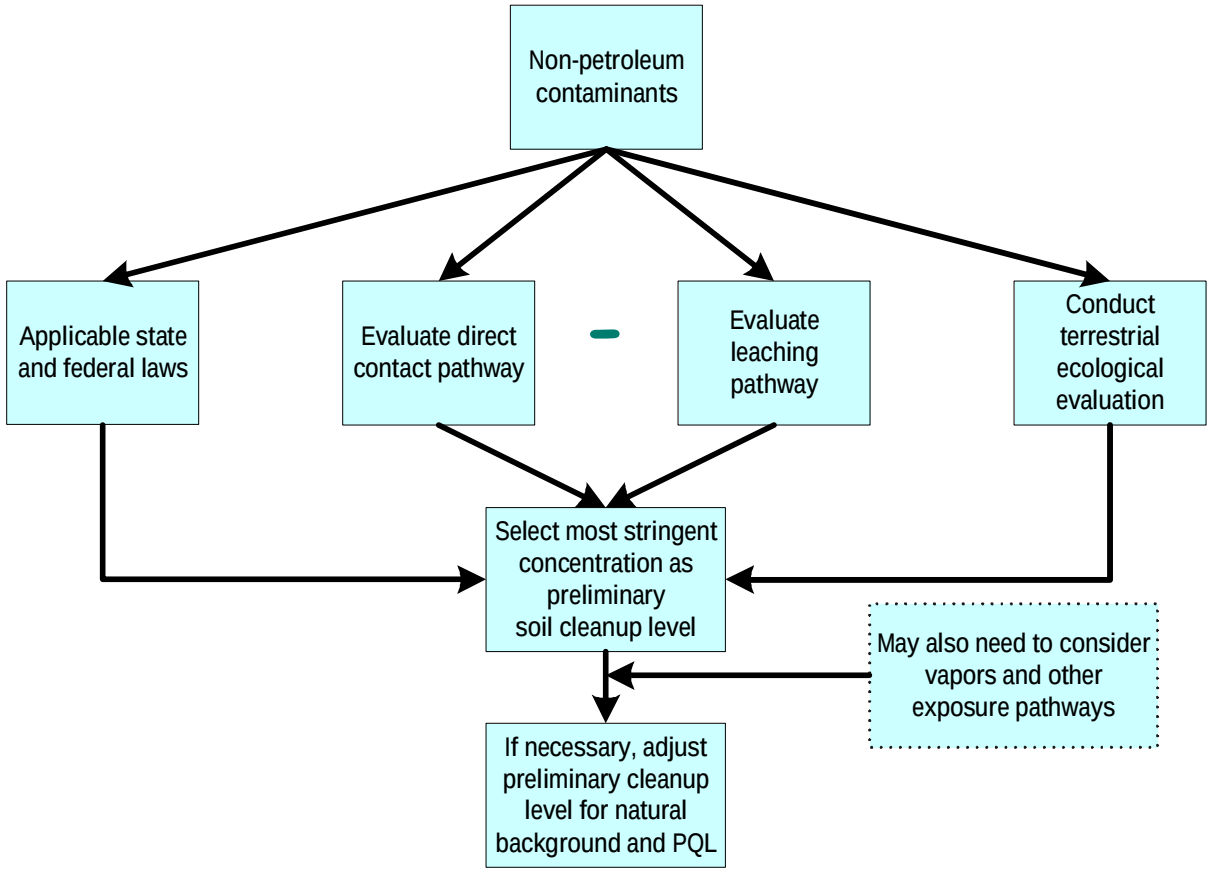
- Ground water--RME is a person drinking the water
- Surface water--RME is surface water classification (must consider both fish consumption and aquatic impacts)
- Air—RME is a person breathing the air in a residential land use setting

Reasonable Maximum Exposure (RMEs)

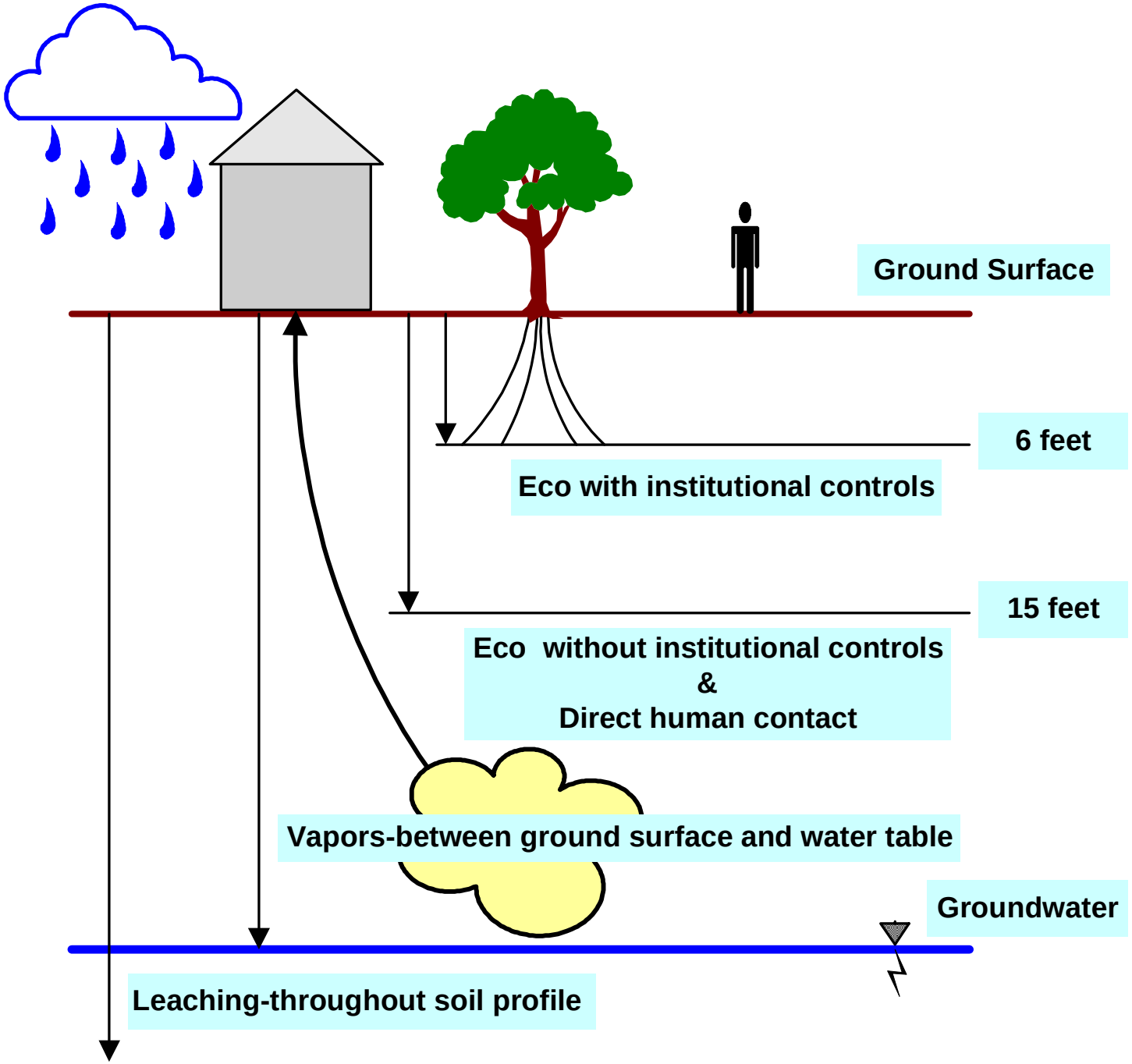
Soil

- RME is residential land use for most sites.
- Industrial land use an option for qualifying industrial properties

MTCA Soil Cleanup Levels Exposure Pathways of Primary Concern — Methods B & C



Establishing Soil Point of Compliance Under WAC 173-340-740 & 745



Typical Cleanup Methods--Soil

- Dig and Haul
- Thermal Desorption/Incineration
- Bioremediation
- Cap/Contain
- "In Situ" (In Place) Treatment
  - Soil Vapor Extraction
  - Vitrification/Solidification

Example Soil Remedy—Dig & Haul

Example Soil Remedy—Cap

Example Remedy—Soil Solidification

Typical Cleanup Methods—Ground Water

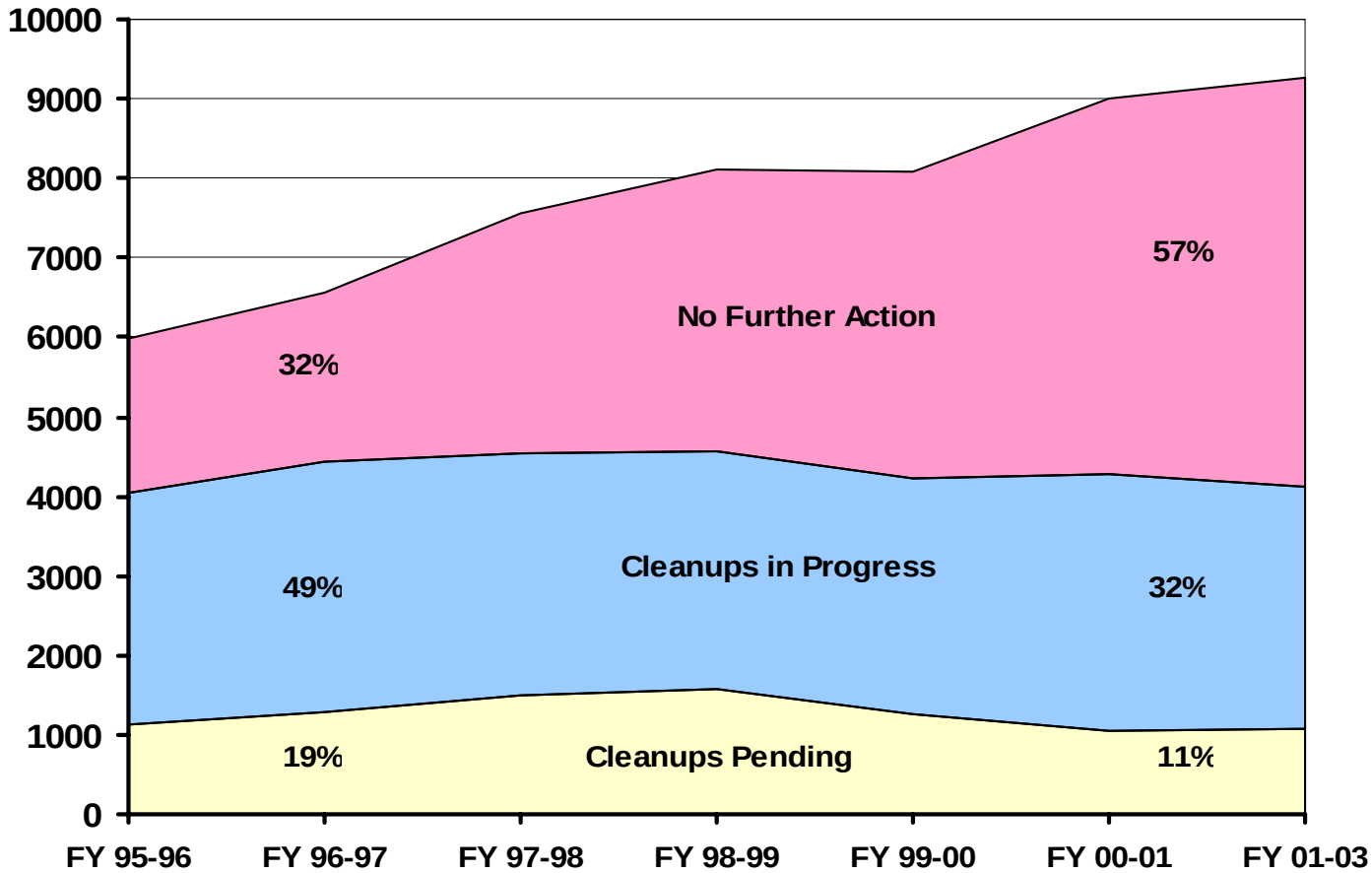
- Pump and Treat
- Containment Systems
- Permeable Reactive Barriers
- "In Situ" (In Place) Treatment
  - Air-Sparging
  - Chemical Oxidation
  - Enhanced Bioremediation
  - Natural Attenuation

Example GW Remedy—Air Stripping

Example Remedy—Bentonite Slurry Wall

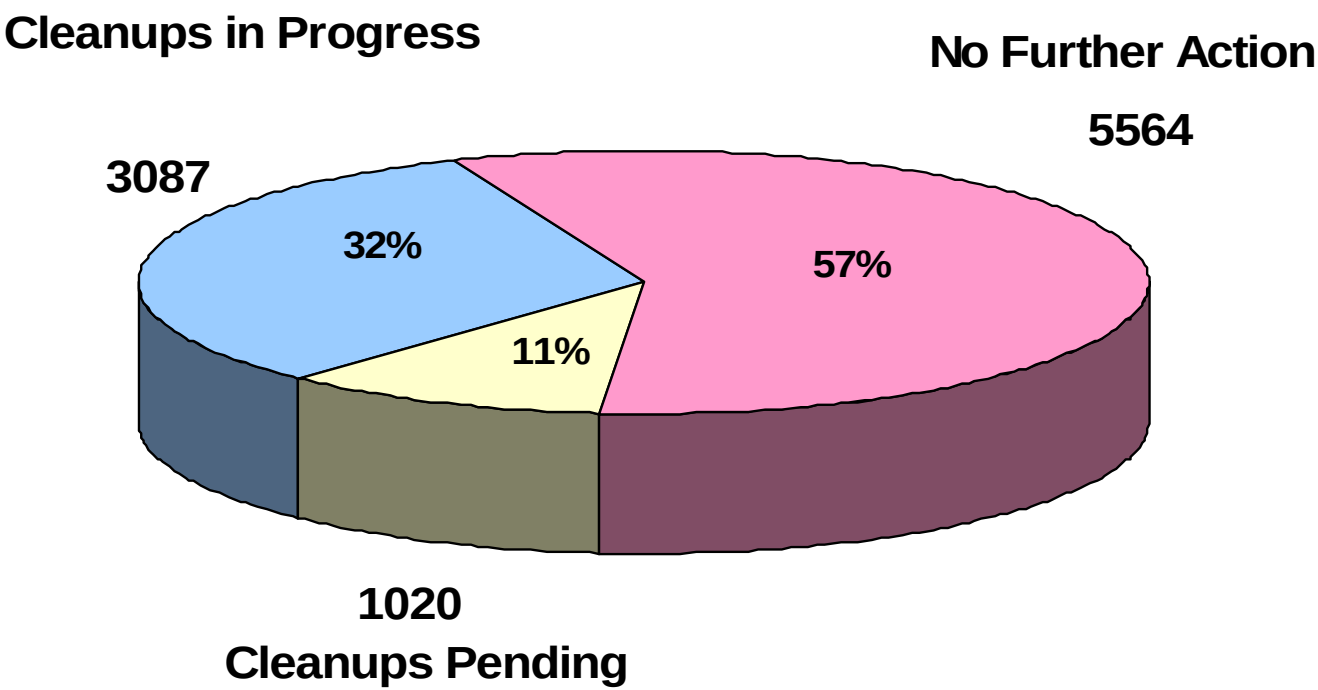
Trend in Status of Known and Suspected Contaminated Sites

(as of January 20, 2004)



Known and Suspected Contaminated Sites Status (as of January 20, 2004)

Total Sites: 9,671



Model Toxics Control Act -Summary-

- Passed as a citizen's initiative in November, 1988 general election
- Rules intended to streamline process for setting cleanup levels
- Judgement involved in setting point of compliance & selecting remedies
- Community involvement in site cleanup decisions is key to success
- WA State has made significant progress in the cleanup of contaminated sites